XXIII.—*Contributions to the Botany of South America.*

By John Miers, Esq., F.R.S., F.L.S.

[Continued from p. 210.]

Brunsfelsia.

Upon a previous occasion (*huj. op.* iii. 176) I suggested the propriety of again separating *Franciscea* from *Brunsfelsia*, which genera had been united into one, by Mr. Bentham, in his excellent Monograph on the *Scrophulariaceæ* (DeCand. Prodr. x. 198). With the view of carrying out this suggestion, I now offer at greater length the observations on which that recommendation was founded. Although there exists a remarkable similarity in several of their respective features, many essential points of distinction may be observed between them: thus, in *Brunsfelsia*, independently of the constant difference in the yellow colour of the corolla, its tube is always comparatively of much greater length, often ten or twelve times that of the calyx, and in all cases is wider and somewhat funnel-shaped in the mouth; the border too is much broader, of more fleshy consistence, more deeply and unequally lobed, the segments being more or less crenated and crispate and somewhat reflexed; while in *Franciscea* the tube is seldom more than three or four times the length of the calyx, and though suddenly a little inflated above, is again much contracted in the mouth, presenting a conspicuous and prominent rim around its very narrow orifice; the colour of the corolla is constantly of a violet or bluish hue, more or less intense; the lobes of the border are quite flat and rotate, and not at all crispate. The anthers in *Brunsfelsia* are at first 2-celled, with the confluent lobes affixed transversely, thus forming an oblong body grooved across, four times broader than long; this bursts by the upper marginal suture assuming the appearance of being unilocular: it takes a vertical position by the inflection of the filament.

In *Franciscea*, the anther, on the contrary, is always distinctly 1-lobed, 1-celled, almost circular and reniform, fixed at its sinus upon the apex of the filament; it is 2-valved, bursting by a nearly marginal hippocrepiform line, and exhibits in the bottom of the cell a fleshy prominent globular receptacle, to which the pollen-grains are attached, as in *Verbascum*. The stigma is similarly constructed in both genera, as is also the ovarium. In *Franciscea* the fruit is an oval capsule, inclosed within the persistent calyx, and covered with a thick coriaceous pericarp, which in one species almost prevents its dehiscence: in such instances the sutural line is always evident, and by pressure the fruit bursts by

these sutures: in most cases, the capsule (which is 2-locular) splits at its apex by four vertical lines: it presents few seeds (about ten) without any intervening pulp. In *Brunsfelsia*, on the contrary, the fruit is a globular deep orange-coloured drupe many times larger than the calyx, about the size of a small apple, with a soft pulpy envelope inclosing a coriaceous putamen, containing many seeds immersed in a fleshy pulp. *Franciscea* grows only to the size of low bushes or small shrubs, while *Brunsfelsia* attains the dimensions of large trees, *B. undulata* being 20 feet high, and *B. americana* growing to the size of an apple-tree with a trunk as thick as the human body.

Brunsfelsia, Sw. (char. reform.).—*Calyx* brevissimus, urceolatus, profunde 5-dentatus. *Corolla* hypocraterimorpha, carnosa, tubo gracili, cylindrico, calyce 4–12-ies longiore, fauce paulo infundibuliformi, limbo valde expanso, obliquo, ad medium 5-fido, lobis inæqualibus, carnosis, rotundatis, undulato-crispatis, subreflexis, inferiore majori, 2 superioribus minoribus, æstivatione valde imbricatis, maximo exteriori. *Stamina* 4, didynama, inclusa; *filamenta* sursum incrassata et incurva, 2 breviora inferiora et lobo majore opposita: *antheræ* oblongæ, sub-bilobæ, sub-biloculares, lobis transversim latioribus et confluentibus, rima marginali 2-valvatim hiantes, hinc pseudo-1-loculares. *Ovarium* conicum, sessile, glandula basali fere obsoleta, aut nulla, 2-loculare, placentis carnosis, valde prominulis, dissepimento utrinque adnatis, multi-ovulatis. *Stylus* gracilis, filiformis, longitudine tubi corollæ, apice incrassatus, interdum subincurvus. *Stigma* clavatum, 2-labiatum, lobis rotundatis, semi-globosis, glandula magna viscosa prominula interposita. *Drupa* magna globosa, calyce parva patente suffulta, epicarpio carnoso; putamen cartilagineum, indehiscens, rarius in valvulis 2 separabile. *Semina* plurima, ovata, compressa, subreniformia, *testa* tenui fragili, minute scrobiculata, *integumento* membranaceo, angulo basali *chalaza* fusca notato. *Embryo* in albumine carnoso arcuatus, heterotropus, *cotyledonibus* ovatis, compressis, accumbentibus, *radicula* tereti 2-plo latioribus et 3-plo brevioribus.—Arbores *Antillani*, foliis *alternis, integris, oblongis, sæpius nitidis*; floribus *speciosis, solitariis, vel paucis, subcymosis, terminalibus*, corolla *flava vel pallide ochroleuca*.

1. *Brunsfelsia americana*, Sw., DC. Prodr. x. 200.
2. ————— *undulata*, Sw., DC. Prodr. x. 200.
3. ————— *nitida*, Benth., DC. Prodr. x. 201.
4. ————— *violacea*, Lodd. Bot. Cab. t. 792.—Subglabra, foliis lanceolato-ellipticis, utrinque acuminatis, subundulatis, supra glabris, minute punctato-rugosis, subtus pallide glaucis et pube

glanduloso-pruinoso vestitis, apice utrinque, costa, nervisque subtus prominulis, rubro-violaceis; floribus subsolitariis, corollæ limbo magno, undulato-crispato, flavo, tubo ochroleuco calyce 12–16-ies longiore.—In Antillis, *v. v. in hort. Kew. cult.*

The leaves of this species are 8 inches long, $2\frac{3}{4}$ inches broad, on a thick and deeply channeled petiole less than half an inch in length. The peduncle is $\frac{1}{2}$ inch long, the calyx $2\frac{1}{2}$ to 3 lines, cleft half-way into five obtuse erect teeth with ciliate margins : the tube of the corolla is $2\frac{3}{4}$ inches long, 2 lines in diameter, swelling below the mouth to a width of nearly half an inch; the border is much expanded, and is $2\frac{1}{2}$ inches in diameter*.

Franciscea.

Having offered under the preceding head, the reasons that appear to justify the separation of *Franciscea* from *Brunsfelsia*, I now give the amended character of the former, as contrasted with the latter genus.

Franciscea, Pohl. (char. emend.).—*Calyx* inflato-tubulosus, ore obliquo, 5-dentato. *Corolla* hypocraterimorpha, tubo angustato, apice dorso subinflato, fauce in oram valde prominulam obliquam constricto, limbo obliquo, rotato, expanso, ultra medium 5-fido, lobis inæqualibus, rotundatis, integris, superiore maximo, æstivatione quincuncialiter imbricatis, sinubus introflexis. *Stamina* 4, didynama, inclusa, brevia, infra dilatationem tubi per paria inserta, 2 longiora infra lobum maximum et superiorem sita; *filamenta* carnosula, compressa, corrugata, apice inflexa; *antheræ* reniformes, compressæ, sinu affixæ, 1-loculares, rima marginali 2-valvatim hiantes, receptaculo pollinifero globoso in sinu conspicuo. *Ovarium* obovatum, glandulo carnoso stipitato imo cinctum, 2-loculare, placentis carnosis, prominentibus, dissepimento utrinque adnatis, multiovulatis. *Stylus* filiformis, apice valde incrassatus et inflexus. *Stigma* 2-labiatum, lobis brevibus, crassiusculis, obtusis, intus glandulosis. *Capsula* ovata, calyce persistente inclusa, coriacea, 2-valvis, 2-locularis, valvis placenta demum libera parallelis. *Semina* pauca, majuscula, oblonga, subangulata, dorso convexa, hilo ventrali, conspicuo, cavo : testa reticulato-foveolata. *Embryo* hilo contrarius, in axi albuminis carnosi incurvus, cotyledonibus ovatis, compressis, radicula tereti gracili infera triplo brevioribus et 2-plo latioribus.—Suffrutices *Brasilienses et Peruviani*. Folia *alterna, integerrima, oblonga*. Cymæ *terminales, dense capitulæformes vel laxius pauciflorœ, rarius ad florem unicum redactæ*;

* This species with generic details will be delineated in 'Illustr. South Amer. Plants,' plate 56.

bracteæ *parvæ*: flores *speciosi, violacei, interdum pallidiores, corollæ tubo calyce subæquante, rarius 2–4-plo longiore* *.

1. *Franciscea macrophylla,* Cham. Schl. Linn. ii. 601.
2. ——— *hydrangæformis,* Pohl. Pl. Bras. i. 7. tab. 7.
3. ——— *capitata. Brunsfelsia capitata,* Bth., DC. Prodr. x. 198.
4. ——— *pauciflora,* Cham. Schl. Linn. ii. 600.
5. ——— *Bahiensis. Brunsfelsia Bahiensis,* Bth., DC. Prodr. x. 590.
6. ——— *calycina. Brunsfelsia calycina,* Bth., DC. Prodr. x. 199.
7. ——— *obovata. Brunsfelsia obovata,* Bth., DC. Prodr. x. 199.
8. ——— *confertiflora,* Pohl. Pl. Bras. i. 6. tab. 5. *F. divaricata,* Pohl. ibid. tab. 6.
9. ——— *ramosissima,* Pohl. Pl. Bras. i. 5. tab. 4.
10. ——— *acuminata,* Pohl. Pl. Bras. i. 4. tab. 3.
11. ——— *latifolia,* Pohl. Pl. Bras. i. 3. tab. 2.
12. ——— *grandiflora. Brunsfelsia grandiflora,* Don, N. Edin. Phil. Journ. 1829.
13. ——— *maritima. Brunsfelsia maritima,* Bth., DC. Prodr. x. 200.
14. ——— *Hopeana,* Hook. Bot. Mag. t. 2829. *F. uniflora,* Pohl. Pl. Bras. i. 2. tab. 1.
15. ——— *australis. Brunsfelsia australis,* Bth., DC. Prodr. x. 200.

Margaranthus.

On a former occasion (*huj. op.* vol. iv. p. 136), although I had not seen any specimen, I noticed this genus in order to contrast it with other allied genera. Since then, I have been glad to meet with a second very distinct species, that has enabled me to comprehend more fully its structural features, and these I find correspond well with the very accurate observations of Prof. Schlechtendal, upon which the generic character (*loc. cit.*) was founded. I proceed therefore to describe the plant alluded to.

1. *Margaranthus tenuis* (n. sp.);—herba glaberrima, dichotome ramosa, ramis divaricatis, tenuibus, angulato-sulcatis; foliis lanceolatis, utrinque acutis, caulinis obsolete pauci-dentatis, longe et tenuissime petiolatis, junioribus floralibus linearibus; floribus pedunculatis, solitariis, axillaribus.—Mexico (*v. s. in herb. Lindley. Coulter, n.* 1220 *bis*).

This plant bears much resemblance to that figured by Prof.

* Sectional details showing the characters of this genus will be given in vol. ii. plate 59 A. of the 'Illustr. of South Amer. Plants.'

Schlechtendal. Its stems however are far more slender, more deeply angular, quite smooth, with internodes about 2 inches apart; the radical leaves may probably be of greater size, but the largest leaves in the specimen referred to, are about $1\frac{3}{4}$ inch long, upon a very slender petiole of $\frac{3}{4}$ inch, and are about 4 lines broad, with four or five somewhat obsolete teeth on the margin. The flowers are seen only in the nascent axils, while the young leaves have not attained the length of 4 lines; the capillary peduncle is very hairy, and about 2 lines long; the calyx is scarcely a line in length, cylindrical, and is densely covered, especially below the middle, with articulate and rigid white hairs: the corolla is tubular, and contracted at base to the diameter of one-third of a line, but as it emerges from the calyx, it swells suddenly in a somewhat globular form to a diameter of 2 lines, marked with five grooves opposite the stamens, and five intermediate saccate projections, which are below the five minute short teeth, that crown the suddenly contracted mouth of the corolla, which is here even narrower than the inferior portion of the tube; it is entirely smooth and apparently of a lurid white, the saccate lobes seeming of a dull violet hue; outside it is smooth, inside somewhat hairy; the stamens, nearly the length of the corolla, are wholly included, the filaments being very short, smooth, somewhat arcuate, and inserted into the basal contraction of the tube; the anthers are four times the length of the filaments, linear, with two narrow cells, fixed along their whole length, upon a narrow dorsal connective which forms an extension of the filament; the cells burst by a longitudinal line in front, and also by an apical pore, for the external valves are there reflected on each side. The ovarium is small, obovate, superior, and fixed upon a somewhat two-lobed annular gland; the style is exserted beyond the mouth of the corolla, is smooth, somewhat subulate, and truncated at its apex by a small stigmatic pore. The matured fruit, in consequence of the apparently quick growth of the plant, is found only in the dichotomy of the branches, where the peduncle is from 2 to 3 lines long: the calyx is now become greatly enlarged, having acquired a globular form, 4 lines in diameter, very finely reticulated, and contracted in the mouth, which is closed by a very small five-toothed orifice; the included berry is globular, $2\frac{1}{2}$ lines in diameter, with a very thin membranaceous pericarp, apparently without pulp, and probably once filled with an aqueous juice; it is two-celled, and contains about fourteen seeds, which are of a large size compared with the smallness of the berry; these are flat, thin, nearly oval, reniform; the testa is scrobiculate and brittle; the horny and rather translucent albumen incloses a somewhat spiral filiform embryo, in which the radicle (at least three times the length of the cotyledon of equal diameter) points

towards the basal angle of the seed below the hilum, which is seen in the marginal sinus*.

LEUCOPHYLLUM.

This genus was first published and figured in the 'Plantæ Æquinoctiales,' and Bonpland in his observations upon it remarks, that although it appears to belong to *Scrophulariaceæ*, on account of its didynamous stamens, it bears in its habit more the aspect of the *Solanaceæ*, and from this circumstance, the specific name of *L. ambiguum* was evidently given to the species he described.

Professor Kunth, in his 'Nov. Gen. et Sp.' ii. p. 360, observes, that this genus may be considered as nearly allied to *Maurandia* and *Antirrhinum molle*, but I cannot perceive any such analogy. Dr. Lindley, in his 'Nat. Syst. Bot.' p. 292, placed this genus in *Scrophulariaceæ*, among the tribe *Veronicæ*, and Dr. Endlicher in his 'Gen. Plant.' follows this example; lastly, Mr. Bentham in his admirable monograph of this order arranges it in his tribe *Gratioleæ*, and his subtribe *Aptosimeæ* (DC. Prod. x. 344). After a careful examination of the structure of this genus, I have come to a very different conclusion, and hope to show, by good evidence, that its true place is near *Atropa* and *Lycium*, and therefore not among the *Scrophulariaceæ*. The structure of the corolla in *Leucophyllum* precisely corresponds with that of *Atropa*, having a campanulate tube, with a small border slightly oblique, of five nearly equal rounded lobes, which are imbricately disposed in æstivation, and five somewhat unequal stamens, two being always shorter; and it sometimes happens that the anthers of one of the three other stamens are abortive, or the fifth stamen altogether wanting; and such is the state, I conclude, of the species described by Bonpland, as I have noticed in Hartweg's specimen, although, in Galeotti's plant of *L. ambiguum*, I have found the flowers to be always pentandrous, as in *L. campanulatum*. All the species of *Leucophyllum* resemble *Lycium* in their fruticose habit, with solitary, axillary, violet-coloured flowers, and one species has an evident tendency to become spinous, like this last-mentioned genus. Had *Leucophyllum* possessed a baccate fruit, its position would unquestionably have been between *Atropa* and *Lycium*; but as it is capsular, it will fall into a new tribe, which may be called *Leucophylleæ*, that will stand between the *Hyoscyameæ* and *Atropeæ* (*huj. op.* iii. 166). The following is an outline of its generic features:—

LEUCOPHYLLUM, Bonpl. (char. reform.).—*Calyx* parvus, profunde 5-fidus, laciniis æqualibus, lanceolatis, erectis. *Corolla*

* A figure of this species and its analytical details will be given in plate 57 of the 'Illustr. South Amer. Plants.'

campanulata, tubo amplo infundibuliformi, limbo 5-fido, subbilabiato, lobis fere æqualibus, antico subminori reflexo, 2 posticis erectiusculis, omnibus oblongis, obtusis, æstivatione imbricatis. *Stamina* 5, inæqualia, inclusa, corollæ dimidio longitudine, 2 antica breviora, quinto interdum rudimentario, rarius omnino deficiente; *filamenta* imo tubi affixa, glabra, basi crassiuscula, apice subdeclinata; *antheræ* sagittato-bilobæ, lobis apice nexis, longitudinaliter intus dehiscentibus, quinti interdum minimæ, aut abortivæ. *Ovarium* oblongum, glandula annulari fere obsoleta imo cinctum, 2-loculare, *ovulis* plurimis, dissepimento medio prominulo et incrassato utrinque adnatis. *Stylus* erectus, filiformis, apice declinatus, longitudine staminum. *Stigma* breviter bilabiatum, lobis adpressis. *Capsula* ovata, coriacea, calyce persistente cincta, septicide dehiscens, valvulis apice 2-fidis, marginibus introflexis, imo basi columnæ subglobosæ placentiferæ adhærentibus. *Semina* plurima, minuta, transversa, oblonga, compressa, dorso plana, quadrato-angulata, longitudinaliter curvata, striato-rugulosa, hilo ventrali et fere basali. *Embryo* in *albumine* carnoso oblongus, curvatus, subcompressus, *cotyledonibus* oblongis, *radicula* basali tereti vix latioribus, et 2-plo longioribus.—Suffrutices *Mexicani, pube brachiato densissime tomentoso vestiti*; folia *alterna, subparva, crassa, uninervia, breviter petiolata*; flores *solitarii, axillares, folio subæquales, breviter pedunculati, corollæ tubo calyce* 2–3-*plo-ve longiore.*

1. *Leucophyllum ambiguum*, Humb., Bonpl. Pl. Æquin. ii. 95. tab. 109; H. B. K. ii. 361;—foliis ovatis, basi apiceque acutiusculis, utrinque densissime tomentosis, cinerascentibus, junioribus pallide incanis; laciniis calycinis lineari-lanceolatis, extus tomentosis, intus glabris, nitidis, 3-nerviis, corollæ tubo amplo 3-plo brevioribus; ovarii apice, stylique basi pilosis.—Mexico. Actopan, Prov. Mexico, alt. 6600 ped., *Bonpland.* Atotonilco el Grande, Prov. Durango, *Hartweg*, n. 357. Zimapan, *Galeotti*, n. 7210.

This is described by Bonpland as a tall shrub, 8 to 15 feet in height, with a stem slightly tortuous, 4 or 6 inches in diameter, covered with a slightly rent bark. It is a very conspicuous object in the forests, showing itself at a distance by its silvery leaves, and forming a striking contrast with the dark green foliage of the surrounding trees. Its leaves are from $\frac{1}{2}$ to $\frac{3}{4}$ inch long, 5 or 6 lines broad, with a petiole 2 lines in length; its calyx measures 2 or 3 lines, and is smooth within; its violet-coloured corolla is $\frac{1}{2}$ an inch long, smooth outside and pilose within. This species may readily be distinguished from the others, by its leaves being acute at both ends; in the older ones the tomentum is of a

blackish gray, in the younger leaves of a pale yellowish white; the small branchlets are 4 to 8 inches long, almost bare, prominently knotty at the articulation of the fallen petioles, with only a few leaves towards the extremity, and with solitary flowers in their axils. Bonpland describes the stamens to be didynamous, quite glabrous, and the upper lobe of the corolla woolly within, and the tube pilose inside to the insertion of the stamens. Kunth, who probably examined very imperfect specimens, says, on the contrary, that it is quite smooth within, and that it has a convex palate marked with orange-coloured glandular spots, but I can perceive no indication of such a palate. In the above-mentioned specimens, the calycine segments are smooth within; the corolla is also smooth, and hairy only in the mouth and upon the lobes of the border. Galeotti's specimen, as I have before observed, has distinctly five fertile stamens, Hartweg's has only four.

2. *Leucophyllum Texanum*, Benth., DC. Prodr. x. 344;—ramis glabris, tortuosis, nodosis, subspinescentibus, junioribus tomentosis; foliis obovato-oblongis, apice rotundatis, utrinque cano-tomentosis; calyce extus tomentoso, laciniis lato-lanceolatis, intus pubescentibus et 3-nerviis; corolla præcedentis, staminibus 4 didynamis, cum quinti rudimento, filamentis complanatis, lævibus: capsula apice pilosa.—Mexico, Prov. Texana, *v. s. in herb. Hook.* (Laredo, *Berlandier.*)

In this species the branchlets are more glabrous, more tortuous, and more knotty at the axils of the fallen leaves, often spinous at the short abortive branchlets, the leaves more obovate-oblong and rounded at the apex, the younger leaves incanous, not ferruginous, the calycine segments more oblong and broader; the leaves are 7 or 8 lines long, 4 or 5 lines broad, the petiole being scarcely appreciable; the calyx is $1\frac{1}{2}$ line in length; the corolla, including the lobes of the border, is $\frac{1}{2}$ inch long: the calyx, though persistent, does not increase in size in fruit; the capsule is small, ovate, $1\frac{1}{2}$ line long, the two valves being inflected at the margin, very thick and coriaceous, and bifid nearly to the base.

3. *Leucophyllum campanulatum* (n. sp.);—ramis substrictis, ramulis abbreviatis, approximatis; foliis ovato-orbicularibus, crassis, utrinque densissime tomentosis, adultis incanis, junioribus confertissimis, ferrugineis; floribus axillaribus ideo arctis, folio superantibus, calycis laciniis crassis, lanceolatis, apice obtusiusculis; corolla præcedentibus dimidio majore, glabra, intus simpliciter hirta, ovarii apice, stylique basi, dense pilosis.—Mexico, *v. s. in herb. Lindl. et Hook.* (Zimapan, Prov. Mex., *Coulter*, *n.* 1271).

This species is very distinct from the two former, its leaves

being more orbicular, 8 lines long, 7 lines broad, on a channeled petiole 2 lines in length, the older ones being always incano-velutinous, the younger of a deep ochreous colour; the branchlets are very much crowded, and not longer than 1 or 2 inches; the axils much closer, with more copious foliage, hence the flowers appear densely crowded: the corolla is of a deep violet-blue, 7 or 8 lines in length, broader in proportion; its border is somewhat oblique, with five rounded lobes, the anterior one more reflected, the two posterior lobes more erect; it is nearly smooth outside, and very pilose within. Another characteristic feature is, that the upper moiety of the ovarium, and the lower portion of the style, are densely covered with white hairs, the basal gland being smooth; it has constantly five stamens, of which the three anterior are somewhat shorter. The hairs of the corolla and pistillum are simple and articulated, those of the calyx stellately plumose, as in the rest of the plant*.

XXIV.—*Heights of some points of the Cotswold Hills, with some experiments with the Aneroid Barometer.* By W. Henry Hyett, Esq., F.R.S.†

A few months ago, in a formal Report, an Inspector under the Board of Health stated that "Cheltenham has been estimated to stand 200 ft. above the level of the sea, and the height of the Cotswold Hills above the same level is about 300 ft.:"—he meant probably to say "above the level of Cheltenham;" thus making the absolute height of these hills 500 feet above the sea—still an estimate rather wide of the mark when given under the nose of Cleeve Cloud, which exceeds 1000.

It is true the case required no accuracy, but such a degree of *in*accuracy could scarcely have appeared had a more general knowledge of the truth prevailed in this part of the country. Indeed it has been for years matter of complaint that even the relative heights of the several remarkable points of our Cotswolds were unknown—Painswick, Birdlip, Leckhampton and Cleeve Cloud each having their respective champions, but with no authority to quote, nor umpire to determine between them.

Having consulted some of the scientific Members of the Cotswold Club on the point without success, I ventured to suggest that they at least should try to set it at rest. The coincidence of the present Ordnance Survey for the improvement of the river Severn, having their signal staffs actually standing on the very

* A drawing of this plant with sectional details will be shown in plate 58 of the 'Illustr. South Amer. Plants.'

† Read to the Cotswold Nat. Hist. Club, Sept. 27, 1849.